Editorial

The Seven Habits of a Highly Effective Interventional Radiology Clinician-Scientist: The Keys to Co-Navigate Your Career as a Research Scientist

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The 1989 book "The 7 Habits of Highly Effective People" by Steven Covey is a well-known self-help guide to success.[1] Recently, Mohammad Arabi published a modern play on this book by highlighting seven habits of highly effective interventional radiologists (IRs).[2] However, being a clinician is only one aspect of IR, and as the specialty continues to grow, the role and importance of an IR-led evidence-base is becoming apparent.[3] Evidence-based medicine now forms the core of daily clinical decision-making, guidelines, recommendations of regulatory bodies, and government funding.[4]

Modern IR clinician-scientists are a small but growing breed, but in many centers IR research infrastructure is relatively immature compared with established research-oriented specialties such as oncology and surgery.[5] In addition, there is a global workforce shortage in IR and we face challenges to meet clinical demand, let alone foster science.[6]

In this commentary, I discuss what I believe are seven habits of a highly effective IR-scientist and suggest habits that will allow others to forge this exciting path toward positive data-driven change.

Habit 1: Make a Team, but Be a Leader

What can be achieved on your own is dwarfed by the magnitude of what can be achieved by a team. This team may contain a range of members including other IRs, fellows, nurses, radiographers, and research-specific staff. I would also encourage IRs to support junior hospital staff that seek you out for research opportunities. By utilizing these colleagues, you can arm your team with the ability to simultaneously run different projects in parallel while also giving academic agency for each individual team member. In addition, it allows you to be a transformational leader and role model within local academia at your institution.[7,8] What begins as a small team will grow as productivity increases. Your mentees will finish their training and become individually productive. This means either supercharging your team as senior staff or moving on and developing a new team in another hospital, thus growing, expanding, and perpetuating the effects of your foundation building.

Habit 2: "Clinical Correlation Is Advised"

Developing a relevant research question is vital at the beginning of any project. Use research topics that are clinically relevant to IR, based on your practice or based on current local controversies. Develop a question based on your patients or think about cost and cost-effectiveness. By using an appropriate study design in the Patient, Intervention, Comparator, Outcome (PICO) format, you will be asking questions that need an answer.[9] It is ineffective and inefficient to treat research like an audit, where the question comes after the data collection and which risks providing an answer to a question that no one asked. The immense value of being both a clinician and a scientist in this process is that only you know where existing evidence lacks and thus are in the best position to lead a team to address evidence "gaps."

Habit 3: Remain Motivated

Research is already a very long process, taking many months to years to cultivate an idea into an eventual publication. So,

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when it comes to research productivity, don't do it tomorrow. Tomorrow will have its own new challenges that bring new roadblocks. Do it now. Use the finite time you have, which may be your nonexistent "spare time" after-hours, moments in between operations, in the airport lounge, or after your children have gone to bed. The hardest part is getting started, but if you gain momentum, then this will be rewarded. If you already have protected academic time at work, then this is ideal, but most IRs will not resonate with this concept. I hope that with an expanding workforce and better scientific respect, the field of IR will develop these roles in an iterative process as we evolve.

Find whatever motivation you need. You may want to prove a clinical point to a colleague or target a new job that requires research experience. You may be looking at academic promotion. Or you may want to attend and present at a conference. Regardless of the motivation, harness it and use it like an energy source. As a leader and role model in your research team, the wider group will use your energy as their own motivation too.

Habit 4: Collaborate

While this is true for both clinical IR and research, networking remains an imperative component of being an effective researcher.[10] You should collaborate with your own team even those who are not traditional "researchers." But don't forget the importance of working with other non-IR specialists in your hospital, IRs in other regions, and IRs in other countries. Networking encourages considerate and respectful development of balanced science, especially when multiple clinicians interested in a topic each take an approach from a different angle. Collaboration also encourages relationships that build research networks, beyond simply individual publications. This will then lead to lasting infrastructure and eventually funding.[11]

You must also share your research using modern platforms such as Twitter and LinkedIn, in addition to conferences and scientific meetings.[12] This will allow you to rapidly discuss and dissect ideas within the context of others' experience and other literature, thus developing concepts for subsequent projects with a network of like-minded people.

Habit 5: Work on Weaknesses

An effective researcher must have a grasp of the core principles of research methodology and statistics, as this underpins successful research and publication.[13,14] As the center of a research team, others will look to you for guidance. If you don't know what you are doing, then you should bring an expert into your team. Even better, an effective researcher should work on weaknesses by learning any deficient core skills.

For example, many years back I self-identified a knowledge gap with statistical software. For a research project, I engaged with a statistician to help develop a regression model with a single binary output, and six covariates. The statistician was busy, and it took weeks to find time to meet. As the statistician was not an IR, it was difficult for them to understand the data and at the conclusion my team was left with a significant cost for service. As a result, I decided to address this weakness myself by learning statistics. In retrospect with new knowledge gained, a regression model could have been developed in approximately 10 minutes by any clinician-scientist who knew the research question, the data, the statistics, and the desired output needed. These skills can then be shared and taught to others in your team.

Habit 6: Know How to Deal with "Reviewer 2"

An effective leader establishes respect, which leads to inspiration and influence of their staff.[7,8] In research, to gain this respect you must show others that you are indeed the expert you claim to be. This means that you must write papers yourself. There are other equally important skills to know such as how to respond to reviewers and how to navigate the submission and production process. Don't delegate all your research tasks, only to be left with nothing yourself. This projects poor leadership skills to your team and risks disharmony.

By being an effective writer, you are also able to help your team who are writing on your behalf, and direct them as appropriate. This may include things such as clarity, tense, structure, and referencing. An effective IR-scientist must also review papers, to know what reviewers are thinking during the editorial process—and a key to understanding the infamous reviewer 2! By being critical of others' work, you can also be critical of your own. Self-critique is most important during planning, but similarly vital at the stage of writing.

Effective writers focus on their target journal from the start and review the "author instructions" before writing. For example, it is inefficient to write a 6,000-word thesis and later trim it to a 1,500-word limit. This is becoming more relevant as many journals now move smaller studies to short formats (e.g., brief report or short communication), or request investigations be rewritten as a letter to the editor.

Habit 7: Celebrate Wins

While a single publication may be a small or insignificant milestone as your career advances, motivation is fostered in a positive feedback loop when small wins are celebrated.[15] Additionally, a publication may be a major accomplishment for someone else in your team. For example, it may be enough to get a junior doctor a job, provide a reason to attend a conference, or even provide a sufficient nidus around which a junior doctor can build an application to enter a training program. Positive reinforcement is a powerful tool and should be used by an effective leader.

Conclusion

These seven habits underpin many successful IR-scientists, and merging these with the seven habits discussed by Arabi in his review of an IR clinician[1] will form a highly effective modern IR clinician-scientist. I look forward to seeing the

growth of the specialty of IR where a new group of IR clinician-scientists find a niche, leading to a data-driven change that will underpin future IR practice.

Ethical Approval Statement

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Formal Ethics Committee approval was not required for this manuscript.

Conflict of Interest

None declared.

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